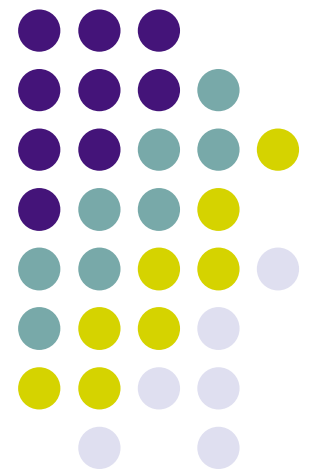


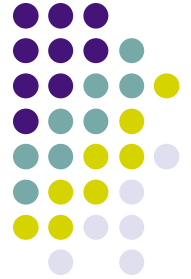
Workflow Overview

NASA SIVO Code 610.3

Meeting with GMAO

Feb 14, 2007

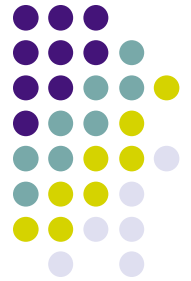




Outline

- Overview of the Workflow system
- Demos
 - NED (Workflow configuration)
 - GEOS workflow
- Discussion

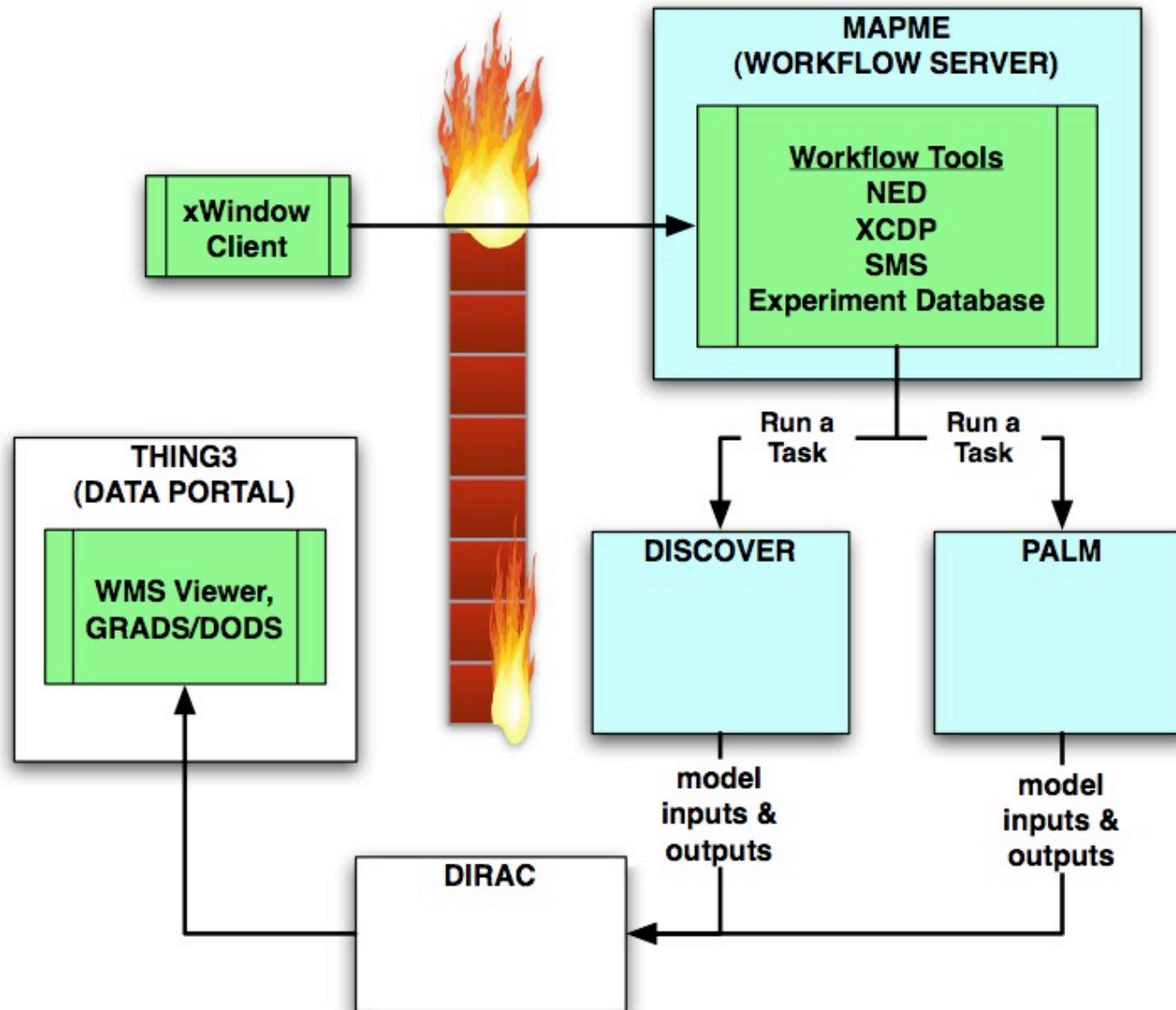
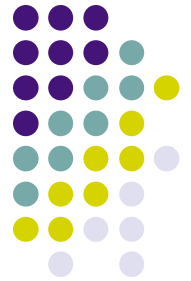
Workflow Tool



A system that provides end-to-end support for setting up and running complex model experiments.

Enable users to concentrate on the scientific results rather than the system environments.

Workflow System in NCCS



- Run from single location within NCCS: “mapme”
- Connects to HPC resources to perform tasks
 - palm
 - discover
 - dirac
 - *Others*

Workflow Tool Components



File Search Tools Database Submission

BEG_DATE

END_DATE

JOB_SGMT

DT

MODEL_RES

LM

NX

NY

tot_run_segs

group_list

CLEAN_WF

GCS Components

Ocean

OCEAN_MODEL

OCEAN_RAD

BIO_CHEM

SEA_ICE

Atmosphere

AGCM_MODEL

FVcore

Workflow setup

TMP_DIR

WF_DIR

MASTOR

VIS_DIR

Installation settings

Group Property		Information	
Name	Ocean		
Description	Settings for ocean component		
Pre-Processor			
Output Type	BASH Shell Transform		
Output File	exp_env.bash		

Name	Description	Data Type	Values
OCEAN_MODEL	Type of ocean model	STRING	MOM4
OCEAN_RAD	Ocean radiation model	BOOLEAN	MOM4
BIO_CHEM	Biochemistry	BOOLEAN	MIT-OGCM
SEA_ICE	Sea ice	STRING	Data model

Status	Affects	Description
Success	GEOSGCS	The workflow was validated successfully

```

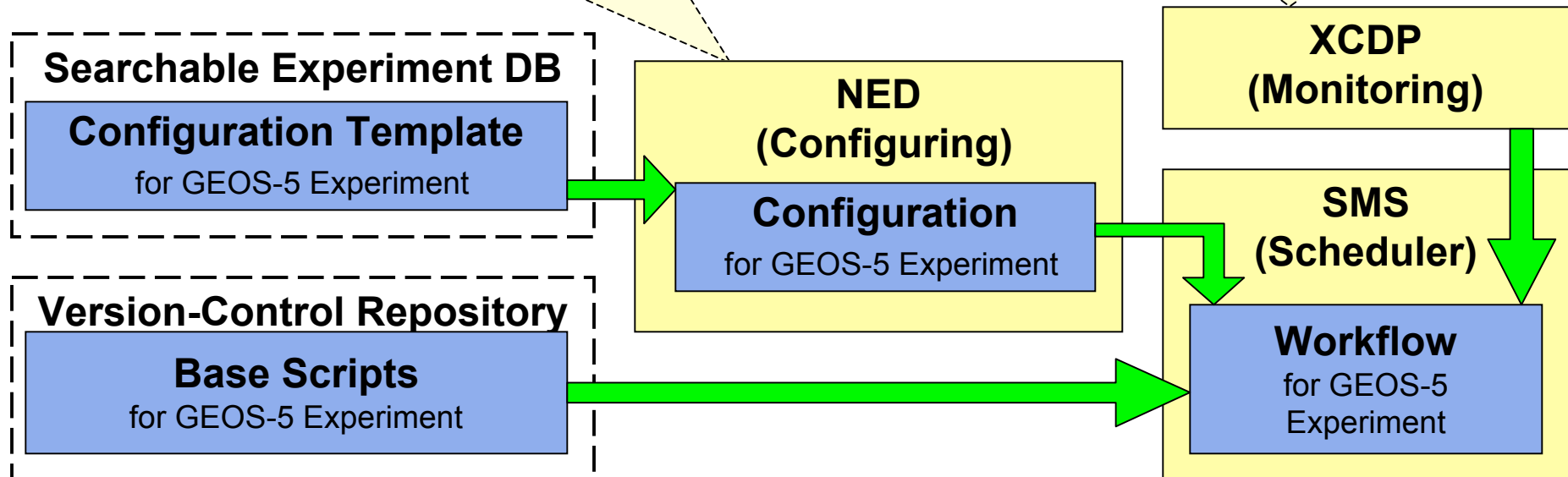
File Edit Show Servers Windows
2008-02-13 19:47

localhost
GEOSgcm_GEOSGCM_srki_2008_1_4_4_37_0_813
GEOSgcm_GEOSGCM_srki_2008_1_4_4_50_52_691
GEOSgcm_GEOSGCM_ccruz_2008_1_4_5_11_11_6
sensorWeb_rbums_2008_1_7_4_35_31_423
GEOSgcm_GEOSGCM_rbums_2008_1_13_2_48_52_925

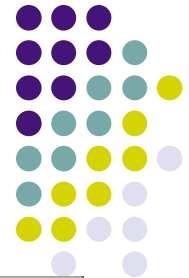
prepare_env setup_vrf_env Info: Setup workflow environment
setup_model_env Info: Setup model environment

main
prepare_env == complete
load_batch_parms load_batch_parms == complete
create_exp_dirs create_exp_dirs == complete
create_rc_templates create_rc_templates == complete
create_live_rcs create_live_rcs == complete
linkbcs linkbcs == complete
getgcm_rst_exe Info: Get executable and restarts
regress_test getgcm_rst_exe == complete
runloop getgcm_rst_exe == complete

RUNSEG=1
run_model
rename_chk_to_rst run_model == co
archive_restarts rename_chk_to
rename_rst_for_ana archive_restart
move_history rename_rst_for
post_processing rename_chk_to
gsi_analysis Info:
resubmit Info: move_history =
  
```



NED GUI: Main Windows



File Search Tools Database Submission

Experiment Tree

- BEG_DATE
- END_DATE
- JOB_SGMT
- DT
- tot_run_segs
- group_list
- CLEAN_WF
- GCS Components
 - Ocean
 - OCEAN_MODEL
 - OCEAN_RAD
 - BIO_CHEM
 - SEA_ICE
 - Atmosphere
 - AGCM_MODE
 - FVcore
- Workflow setup
 - TMP_DIR
 - WF_DIR
 - MASTOR
 - VIS_DIR
- Installation settings

Group Property		Information	
Name	Ocean		
Description	Settings for ocean component		
Pre-Processor			
Output Type	BASH Shell Transform		
Output File	exp_env.bash		

Group Configuration Panel

Name	Description	Data Type	Values
OCEAN_MODEL	Type of ocean model	STRING	MOM4
OCEAN_RAD	Ocean radiation model	BOOLEAN	MOM4
BIO_CHEM	Biochemistry	BOOLEAN	MIT-OGCM
SEA_ICE	Sea ice	STRING	Data model

Variable Configuration Panel

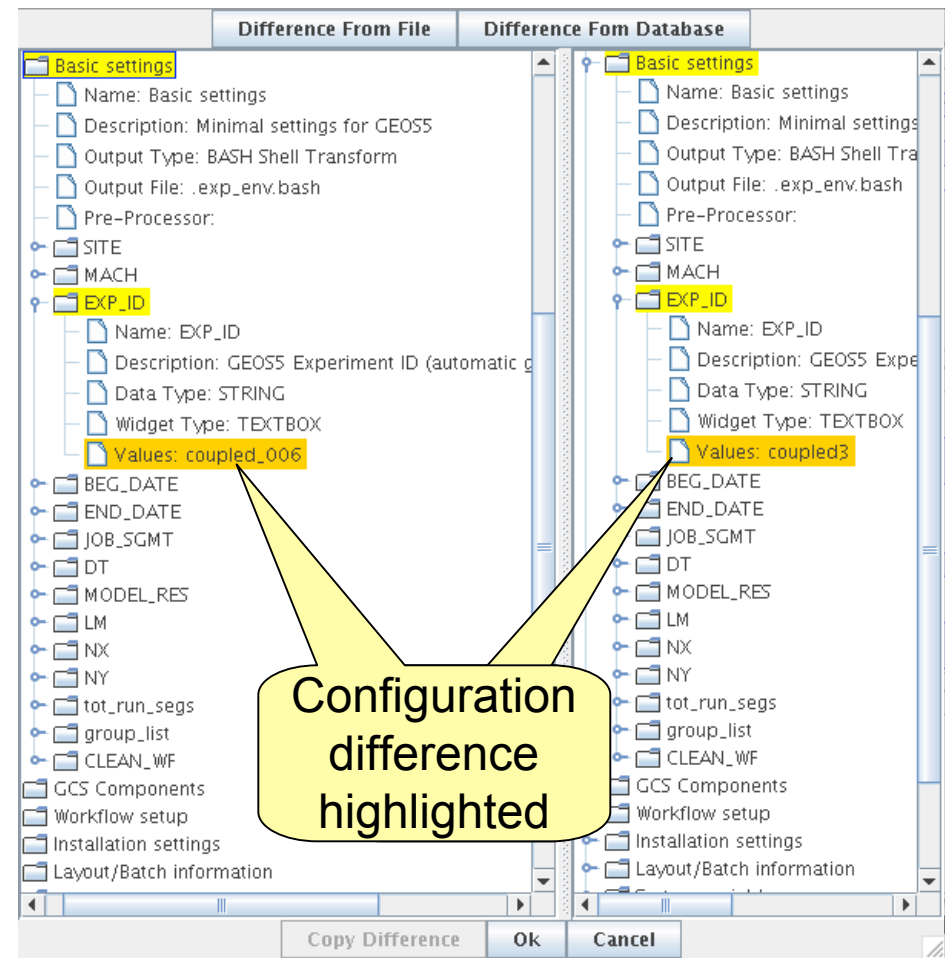
Status	Affects	Description
Success	GEOSGCS	The workflow was validated successfully

Status Panel



NED Features

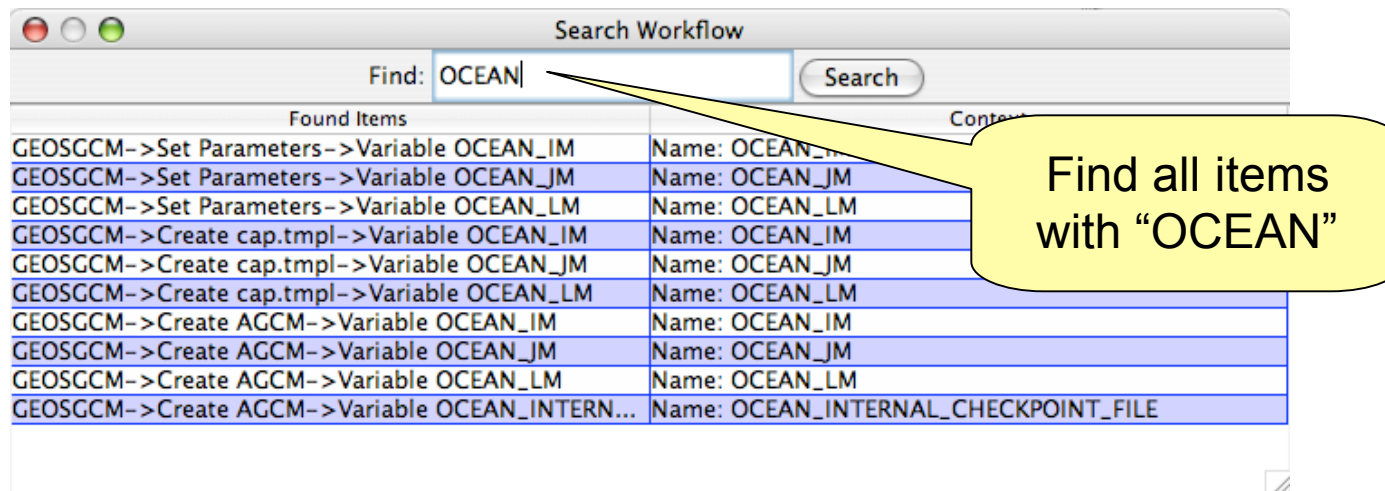
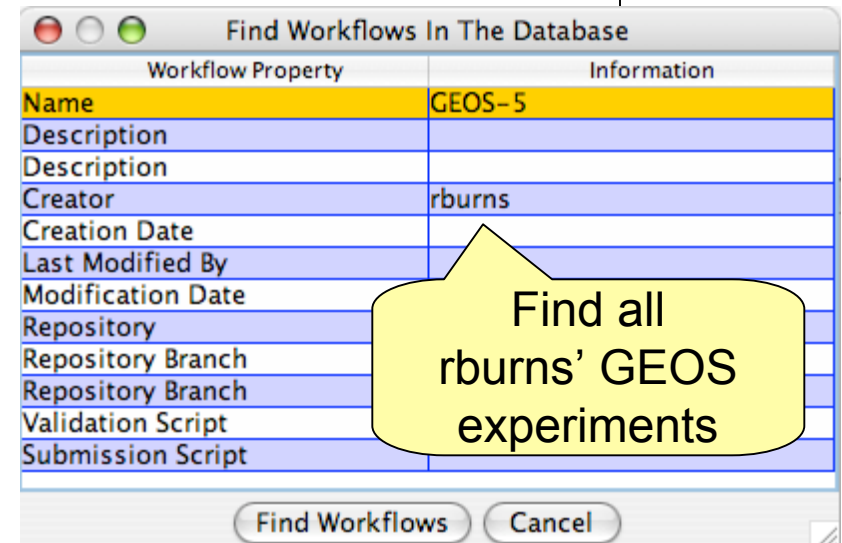
- GUI allows simple configuration of experiment workflow variables
- “Design-mode” to **create templates** for experiment configurations
- **Collaborate** by sharing configurations via XML file or searchable database
 - Re-run/use past experiments
 - Share with other users
- **Compare configurations** for changes
- **Version-controlled scripts**
 - Offer development branches
 - Automatic workflow updates







NED Features, cont.

- **Search** capability:
 - Inside experiment configurations
 - Or search the whole collection of previously run experiments
- **Automatically check** for valid settings before running
- Will be working on web application





NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION



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[NASA Modeling Guru](#) > [MAP Modeling Environment Workflow Tool](#) > Documents

[Up to Documents in MAP Modeling Environment Workflow Tool](#)



The MAPME Workflow Tool

Created on: Aug 27, 2007 5:35 PM by [ccruz](#)
Last Modified: Dec 19, 2007 9:21 AM by [ccruz](#)

VERSION 5
PUBLISHED


Overview


The Workflow system is a tool designed to configure, run, monitor and manage complex model experiments for NASA scientists. Users configure, monitor and manage experiments via an easy-to-use GUI rather than changing configuring scripts and executing system commands. The system takes care of scheduling the individual tasks that make up the workflow to run in the proper order. Such tasks include source check-out, building the executable, execution, post-processing, visualization, etc. Experiments can be customized for many systems and models, and run from one convenient location.

The tool borrows components from ECMWF's workflow tool and has a GUI developed by SIVO. A prototype tool is currently running under NCCS.


Resources for Users


[WorkflowOverview.ppt](#) – a presentation that shows some of the benefits, features and design of the Workflow tool

[Workflow User Guide](#)  – how to use the workflow software

[GEOS-5 Workflow Tutorial](#)  – how to run the GEOS-5 workflow example experiment

Resources for Developers

[How to Design a Workflow](#)  – basic instructions on how to develop an experiment using a simple example

[Creating a new workflow](#)  – a discussion on various issues involved in creating a workflow

Modeling Guru



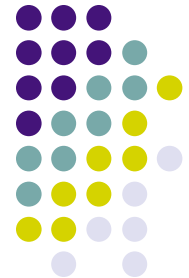
<https://modelingguru.nasa.gov>

Community:

“MAP Modeling Environment Workflow Tool”

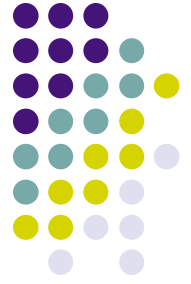
- Contains resources (e.g. GEOS workflow tutorial)
- Suggestions/comments welcome to be posted to the community

Tool and Workflow Development



- Iterative & incremental development
- Feature requests/issues added to backlog
- Beta releases
- Enhance both tools and GEOS workflow

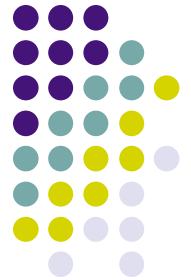
	A	B	C	D	E
1	MAPME Workflow Iteration Backlog				
2	Iteration: 2/13/08				
3	Name	Owner	Est.	Prt	Notes
8	NED - move logging to a specific directory /home/workflow/log	SF		4	RB - will be required for restricted (i.e. reduced risk of corruption) user environment
9	Bug: working dir month off by one	SF		4	RB - more difficult to find experiment, also use filler zeros for digits (i.e. jan is "_01_" not "_1_"); Also remove "tmp " from name
10	GEOS WF history output changes failing	MD		3	BP - HISTORY is fixed at present. Requires some re-design. Can we use the HISTORY template?
11	GEOS WF - Add options for vertical levels and top of level	MD		1	RR - DEFERRED -- Difficult to implement, lack of GMAO support
12	GEOS WF: Swap MOM4 ocean model and ocean data model	CC		1	RR - ROSES proposers demonstration
13	GEOS WF: Report on how to swap physics components from GMAO to NCEP	CC	3-10?	3	RESEARCH ONLY
14	GEOS WF: Report on how restarts might be made more integrated with workflow	CC		3	
15	Minimal system restrictions can allow users to corrupt tool	RB	0.5-?	2	RB - creating two groups - dev & user -- Update: defined and requested changes, but waiting until after the 15th Demo
16	Test Beta 2 Release	All		1	
17					
18	Previously Completed				
19	Investigate SMS integration with TotalView	SF	0.5	4	GM - reference email from Gail for ECMWF documentation
20	Add resolution field to GEOS WF to replace dimensions	MD	0.5-1	2	dim variables (all of them) should be replaced with single dim selection 2,1,1/2,1/4 degree selections -- move dim variables to script conditional
21	Bug: Terminal window from mapme may report "X11 connection rejected because of wrong authentication"	RB	0.5-?	2	BP - A few of us have seen this now. Recommend reboot end-user system. Likely an X11 quirk that happens on a number of systems. Letting go on hold for now.



Next Steps

- ***On-going Tool Development***
 - Continuing to support beta users
 - Releasing beta versions of tools & GEOS workflow
 - Adding new features to tools & GEOS workflow
 - Other plans include expansion to NAS and making tools available as a web application
- ***ROSES Support***
 - Dialog between SIVO, GMAO & HQ
 - Plan new features to make available to proposers

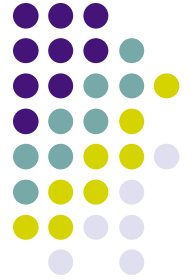
Next Steps, cont.



Coupled ocean runs in next beta release

Name	Description	Data Type	Values
OCEAN_MODEL	Type of ocean model	STRING	MOM4
OCEAN_RAD	Ocean radiation model	BOOLEAN	<input type="checkbox"/>
BIO_CHEM	Biochemistry	BOOLEAN	<input type="checkbox"/>
SEA_ICE	Sea ice	STRING	CICE

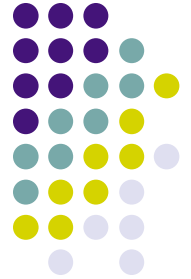
- ***Collaboration with you (GMAO)***
 - Solicit beta testers to evaluate and suggest improvements:
 - *What features would like to see?*
 - *How can we improve it?*
 - Tool training and assistance for using/designing workflows
 - Collaborate on improvements for running GEOS and managing data



Demos
NED
GEOS-5 GCM

Discussion

BACKUP SLIDES



Workflow System in NCCS

